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VOLUME X
Number 12

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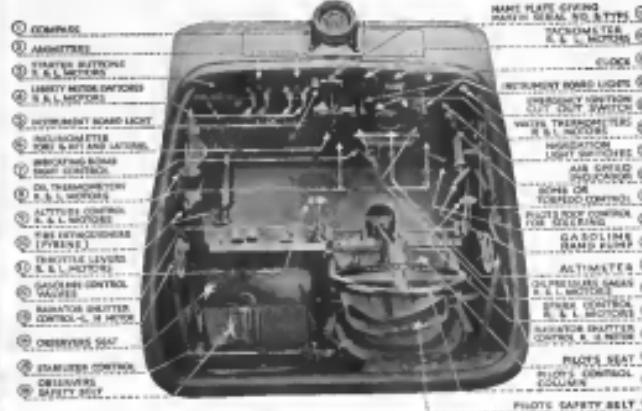
THOMAS-MORSE AIRCRAFT CORPORATION



Thomas-Morse Training 2-Seater
At Right, 1918, U.S.A.A.F.

THOMAS-MORSE AIRCRAFT CORPORATION

In the Pilot's Cockpit



HERE is the center of control of an 800 H. P. Glenn L. Martin Airplane. This cockpit is roomy enough to provide comfortable quarters for two good sized men clad in heavy fur-lined flying suits.

There is ample space for the use of maps and charts, and the whole installation is specifically designed to give the pilot direct and easy manipulation of all engine and flight controls regardless of his heavy fur-lined gloves. It's as complete as the kitchen of a dining-car - as free of action as the control of an automobile.

All instruments and controls are plainly labelled; those to which contact reference is made are self luminous and all controls are lettered to show at a glance whether they are "on" or "off," "open" or "closed."

Because this cockpit is at once, wheel house; chart room, engine room, and because upon its completeness depends the safety of navigation in four dimensions, there is nothing in ocean liner, railway engine, or automobile to compare with it. It represents the last word in scientific control, and is, in its completeness, characteristic of the thoroughness and integrity which mark the entire structure of a Glenn L. Martin plane.



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AVIATION AND AIRCRAFT JOURNAL

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MARCH 31, 1931

No. 33

Air Legislation that Failed

IT is to be greatly regretted that practically all the legislation affecting the government's air activities failed to pass the last Congress. Both the Army and Navy Bills were left unacted so that they cannot be passed before April or May. Congress was too withhold again for the United States to participate in the work of the International Aircraft Standards Commission. Senator New's bill for the creation of a department of aeronautics was not brought up for action. The Bureau of Aviation for the navy should have passed in committee. Even the bill of Congressmen Block in connection with J. B. Tufts as Commandant, and P. H. L. Belanger as Lieutenant Commander permanently did not come to anything. It is to be hoped that with a unified Administration aircraft legislation will fare better in the future.

The Air Force Personnel Problem

NOW that the Air Service has been recognized as a combat arm and the Navy more about to establish a separate bureau of aviation, the problem of air personnel deserves immediate consideration. In the event of war, the first line of defense is the air. There can be, then, no delay in mobilization. We cannot wait on after holding the line, while we begin to prepare. The air force must be ready to move out without delay; nor can it be done, unless the personnel be adequate an amateur and efficient on "D" day. One vital factor must be taken into account in the consideration of this problem: the United States is traditionally unwilling to maintain, as a part of the permanent peace establishment, the requisite forces. Whether such a permanent force is desirable, is a purely academic question. The problem can be solved thus, in but one way: we must train and maintain an adequate reserve, unless we wish to see our country overwhelmed from the air in the next war. This cannot be done unless a medium for the reserve squadrons can be kept always on duty, they must, in short, belong to the regular army. Moreover the training of reserve air officers cannot be done in the somewhat haphazard way the army practices for the training of reserve officers of other arms; the price to blood would come too high. They must be sent through the army schools—a course of 7 months—then periodically receive refresher training with their squadron mates, if they are to become and remain efficient.

This, however, would surely fill the need for the lowest grades. As time goes on, the number of planes equipped in battle rises higher and higher. It takes an ever to predict but the next war will see masses of planes disengaged from the "fire-plane" of the air conflict. The standard of training of our field and general officers must preserve the quickness of judgment and physical fitness as essential in air fighting. This, however, is largely the work of the regular army and navy. All of a man's time is too little to give to it.

Congress went on to it that the framework—the skeleton—was already ready; and that it contains all the elements necessary in an air force, save those lower grades who may be kept well trained with less time and effort, and may therefore be called in from the reserves.

Limits of Thermal Efficiency

A RECENT series of tests by H. R. Ricardo indicates that taking into account losses due to leakage in specific heat at high temperatures and to dissociation that the observed results for the efficiency of an internal combustion engine are negligibly different from the ideal results possible. The scope for improvement in the efficiency of an internal combustion engine would seem very narrow. Ricardo indicates a number of laws of attack from which much may be hoped, however. By the use of steps, each as broad, intake and stroke, compression ratios could be safely increased without risk of detonation to much higher values than at present used. Addition of exhaust gas to the charge might effect a similar purpose.

Another line of attack would be simplification to ensure complete combustion. Ricardo suggests that the two portions of charge ought to be allowed to mix only after ignition. Combustion should open up the possibility of obtaining higher efficiencies by more complete combustion and should reduce the temperature of the cycle. These possibilities are also contrasted with working with a short compression and long expansion stroke. These and other suggestions are well worth studying in the original paper read before the Royal Aeronautical Society.

Aerial Diplomacy

IF the new play "The Green Goddess" a situation arises which will bring favorably to the attention of those who see the advantages of aircraft over other arms in certain situations where slower means of negotiation would have been too late.

A British officer and his party have made a forced landing in a remote part of the northern Himalayas and were about to be put to death by fanatical natives. By the aid of wireless they communicated with a flying field in India and the release of the play is marked when the resulting squadron of airplanes arrives in time to prevent the execution. A handkerchief was dropped in over the assembled people and the single officer who made a landing accomplished his mission.

While this ingenious use of airplanes has only been tried on the stage is Wilson Archibald's delightful play, it will undoubtedly have many repetitions in history. The numerous instances where warships have accomplished similar results during the last century are precedents of the aerial diplomacy of the twentieth century.

Colonel Bane on Aircraft Development *

Briefly stated the recent progress of the Engineering Division of the Air Service is however, far removed from the development of aircraft, armament, bombs and training. All of these have been necessary to all Air Service requirements. When we consider that a military airplane carries from one



FIG. 1. FOKKER ENGINE MOUNTED ON A FOKKER D.VII PURSUIT AIRCRAFT.

to twenty thousand pounds of men with oxygen, parachutes, other conveniences or necessities, fuel and oil, machine guns, armament, ammunitions, sight and control instruments, radio, bombs, etc., plus pilot and crew members, a total distance of 300 miles to 1600 miles or more, and at a speed of from 160 to 190 m.p.h., and that the engine, all armament and equipment must operate or be operated satisfactorily at air temperatures



FIG. 3. CURTISS N.P.1 NIGHT PURSUIT AIRPLANE WITH LIBERTY-6 ENGINE AND TRICE SISTER CANTILEVER WINGS.

varying from 160 deg. F. to 60 deg. below zero, and in all weather conditions the diversity of the problems encountered will be appreciated.

It is usually most convenient in a discussion on a development to consider the complete airplane under the heading of the airplane proper, the power plant, the armament and the equipment, and I will follow that plan.

For night pursuit we have a recent acquisition in the Curtiss Co.'s MP-1 with the Liberty-6 engine. This airplane is still

The airplane proper is perhaps the least of our trouble. We are able to build them strong enough, and thanks largely to the development of the gyroscopic gyroscope to discern an unimportant source because of poor performance. The use of mass does not mean that performance can not be considerably improved. However the installation of all that goes into an airplane is surely accomplished in our complete satisfaction. It is a very difficult job and a great deal remains to be done in making satisfactory simulations of engine, armament and armament. Fokker D. VII with the Fokker engine illustrates an engine installation that provides sufficient strength

March 21, 1921.

AVIATION

experimental, having just completed its static test. The construction of the fuselage is of steel tubing.

New Engines

Our first task in engine development has been to develop existing engines, especially the Liberty 12 and Wright 300 and 360 hp. The Liberty engine has been fitted with inverted vee



FIG. 4. THE LIBERTY 12 ENGINE.

and regular, and at the same time the engine is assembled, which requires much to those responsible for keeping airplanes in commission. It shows that a real restoration is not always possible with impunity. The Verville-Parkard Biplane shows a leaning toward the older extreme. That is not a strain that overcomes since this airplane was not originally designed for the engine.

Going to one or two of the types at present considered for Air Service requirements, we have the Thomas-Morse M.B.2, a single seater pursuit with the 360 hp. Wright engine. Some of these airplanes will soon be in service on the Border. The G. L. Martin Co. M.B.2 is a short distance night bomber with two

high compression pistons, consumptions lower than 45 lb. hr. in one case 32 lb. have been observed. This plane aviation engines on a floating wet bed. The Pratt & Whitney engine is regarded as the best for delivery from power house. A large number of single cylinder twin water cooled power house and water cooled engines under construction are being considered for production. One test of a 550 x 6½ water cooled cylinder with four plugs showed an increase in power, but the plug in using more than two plugs is probably not worth the added complication.

The General Electric supercharger for the Liberty engine, with the variable pitch propeller is being given flight tests.



FIG. 5. 37 HORSE-CAHRS MOUNTED ON A MARTIN BOMBER.
Steps have been taken to develop a supercharger for the Wright 360 hp model. We also propose letting a contract for a gear driven supercharger.

Our work in the development of new types has been largely concentrated on large water cooled engines, and air cooled radiators from 60 to 360 hp. The 360 hp Model "B" engine developed by the Manufacturing Division is now starting its first 100 hours. A reduction gear for the engine has been designed and will be constructed.

The preliminary design of a 1000 hp. 18 cyl. engine is completed and work is progressing on the complete design. The Packard series, and 8 cyl. for mailing, a small "22" for pursuit airplanes, and a large "32" for bombardment types have been started. The large "32" in the engine installed in the Verville-Parkard Biplane has been modified and will have place for three engines with modifications. It is proposed to somewhat increase the size and horse power of the small "22". The Wright engine is being modified as



FIG. 6. DISMANTLED FUSELAGE EQUIPPED WITH FROM A MARTIN BOMBER.

*Address given at R.A.E. Winter Meeting.

as result of the trials and we hope soon to have a satisfactory
process for the ST and P-10.

The radial air cooled type is being served by the Lawrence 240-180 hp. low pressure aero engine and the 350 hp. Wasp radial air cooled engine. The same types of the Westinghouse gas turbine engines as the Wasp are being given to the pre-military tests and we hope to have the engines ready

For radial wave cooled wings we have under consideration one of the barrel type known as the Alaris wing. This wing will permit



FIG. 7. AUTOMOBILE DOCKING STATION, BOSTON HARBOUR.

use of empty shells, for fixed guns, to provide for our experiments, and to provide for the mounting of the gun mountings, we are using gun mounts of the various types of masking guns. It should be explained that the Ordnance Department of the Army manufactures the masking guns, barrels and bases used by the Artillery Service.

The location of field grass has been modified in rather narrow berms because they are eradicated by a dense driven by the regiments, mostly by mechanized means. With the disappearance of the seasonal拜占庭人, the problem will be greatly simplified, since weeds are more easily located than those poles or cables.

In mounting flexible guns three of the requirements are field of fire, ease of operation, and rapidity of fire. The field of fire is somewhat dependent on the design of the bipod, but a new mount has been developed which increases the field of fire, and is reasonably easy to operate. To assist the observer or gunner in handling the guns, a wind compensator for the flexible mount has been designed and constructed. The gun mount has two gears and a quick action lever, so that the gun can be turned 100 degrees and continuously as required, and the compensated by means of a spring is designated to assist the operator.

For securing volume of fire a mount in carry four Lewis guns has been constructed. To take advantage of the mobility of fire of the Browing gun it has been mounted fluidly. Mounting the Browning fluidly has necessitated designing a seat for the ammunition holder in purpose to the Lewis gun magazine with which you are all familiar.

Army Units for the National Guard

The 37 mm. gunner has been mounted in almost every conceivable position in the airplane where it would fit or any one. It has been mounted fore and aft on the Martin Bomber. The 28 mm. autocannon gun has been mounted and fired from the nose.

第十一章 算法设计

Equipment development has been confined largely to the development of crash-landing tanks, parachutes, hangars, it was necessary for the Service Bureau to reply adversely owing to the fact that the state authorities said they could not provide hangars for the surplus.

The Aveline Automatic Airplane Control *

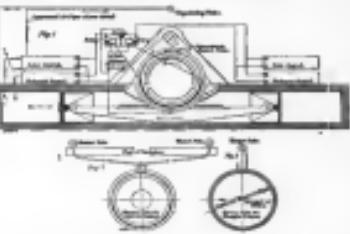
While it must be admitted that the number of accidents directly due to failures on the part of the pilot is extremely small, it is true the loss damage that may occur generally is very heavy. The possibility of such failures should be considered in any aircraft design. A single-engine aircraft, in normal circumstances, is not a particularly fragile machine as far as the airframe is concerned, but a prolonged power-on gust at many speeds subjects her to a degree of lateral and longitudinal strain which it is certainly desirable to avoid by mechanical suppression of the gust. It has been shown that no appreciable reduction in the damage can be obtained by increasing the strength of the airframe.¹ The theory of M. A. Andronov, which has been cited to a Blandford-Page paper,² applies and is capable of relating the point of the whole work of balancing the machine except during the operations of getting off and landing. The pilot, for practicality reasons, will not always then only keep his feet as the rudder, as an order to do so, but the current computer accepts not, the ailerons and elevator being operated by the gyroscopic wheels we propose to describe.

Principles of the Mechanism.

Fig. 5 indicates the principle of that part of the apparatus which controls the solenoids, and is mounted transversely on the angle or other convenient part of the airplane. The essential part of this device is a disc of red fiber in which a capacitor is formed, the electrodes being short lead wires with insulation removed from their surfaces. These wires are connected in series with the two ends of the disc, and an electrical contact is fitted on each side of the disc, and another contact, in series with the interval at the lowest part of the disc, if the machine fails to return to either side the current between the lower contact and the contact, on that side will be completed through the mercury. The upper contacts of the mercury chamber are connected to the two ends of a relay which is caused to complete the circuit of the motor. This relay is shown in Fig. 6, in which the solenoids controlling the upper and lower contacts of a mercury switch are shown. The switch section, as shown in Fig. 1, contains two opposed contacts connected by a rail, and the rail carries with a quadrant post connected to the solenoid windings. When air is admitted to one end of the solenoid, the solenoid valve opens, and the air passes through the valve to turn the motor, which opens the solenoid to reverse the motor, as shown in Fig. 1; the disc containing the mercury chamber is also pivoted in the quadrant, so that it turns and the piston brought to rest after several vibrations corresponding to the moment of tilt. It should also be explained that the rate of movement can be regulated by decreasing the number of turns of the solenoid.

An information system of M. Arribalzaga's invention is the means adopted to counteract the effects of centrifugal forces, but to understand the effect of this part of the apparatus it is necessary to consider its action during a turn. To turn the aircraft the pilot moves the rudder bar with his feet, and the machine makes successive movements to bring round in a curve or circle. The movement of the rudder bar is transmitted to the rudder, which turns the aircraft, and the successive turns of the machine are caused by the centrifugal force. The machine makes a curve in the left-hand arm of the trajectory, because the rudder bar has turned, and the effect of this is to pull down the outer aerofoil and cause the outer aerofoil that carries the machine to bank in the inner curve. The three aerofoils, of course, move in the opposite direction to the aerofoil, and when the machine is in the inverted position it is the inner aerofoil that turns to the right. It is not, however, best to implement this, as soon as the control banking is resisted, it is necessary to replace the aerofoil into the neutral position, otherwise the banking would become excessive and the machine would probably stop up. To avoid this, the arrangement is implemented automatically by the aerofoil's own movement. When the turn is made on bank up the upper wing of the machine and the circuits of the tubes are re-arranged so the arms of the mercury tube are indicated

— 8. 8. 8. 8. —



Translating from Japanese: A Comparison Across Two Discourses

the current longitudinal oscillations, all the loops are extinguished, has a slight tilt in either direction, by shortening the level of the stability, will cause one or other of the loops to light up and indicate the existence of the tilt in the pilot.

The compressed air required to operate the servo-inclines is provided by two small wind-driven motor pumps mounted on the bottom longitudinal as well as side walls of the fuselage. These pumps maintain a pressure of about 60 lb per square inch in a circuit which includes the servo-inclines and the main pump. The main pump also serves as a regulator for air for the rotary pump, those, of course, requiring constant lubrication. A maximum pull of 500 lb can be produced in the cable attached to the quadrants, thus giving ample for the control of the in.

The principal objection to the use of apparatus of this kind, is, of course, its weight, since the maximum payload must necessarily be reduced to make room. The actual weight of the complete installation on the Handley-Page machine above referred to amounts, we are informed, to 150 lb, which is about equal to the weight of the engine. Thus, however, it is hardly so serious as appears at first sight, since the power generating plant is much lighter than was originally intended, and may be 100 pounds lighter of space than of weight, and, moreover, as an unfortunate fact that the machines are rarely loaded to their full passenger-carrying capacity. Another point in favor of the apparatus is that its use would probably avoid the necessity for employing an assistant pilot on a long journey with a large number of passengers, thus reducing the cost per passenger for the benefit of the passengers. It should also be mentioned that, as later designs, the inventor expects to reduce the weight of an apparatus of equal capacity to about 200 lb., and a device designed for use on small two-seater or three-seater machines weighs only 30 lb. In this, however, the use of compressed air is avoided, the servo-inclines being replaced by an ingenious friction gear driven by a small windmill. The invention appears to us to be especially useful in flying

No Establishments in Air Services

The following communication has been passed from Maj. Gen. R. L. Eason, Chief of the Personnel Division, Army Air Service, under date of Feb. 24:

"As a result of your inquiry to the effect that this office was in position to transact about 600 contracts annually, hundreds of communications have been received requesting applications blank and other data pertaining to this training.

"The legislation passed by Congress on Feb. 1, 1931, prohibiting further enlargement in the Army until the enlisted strength is reduced to 17,000 has also been construed as stopping the service from establishing any new establishments. This would appear to these inquiries to the effect that it will not be possible to enlist civilians for this training until the Army is relieved in the above strength. It is estimated that no further enlargements can therefore be made until about the close of the calendar year."

"In order to offset the publicity given to the enforcement of the new regulations applying to flying instruction, and in order to reduce the apprehensions on this subject at this time, it is recommended that publicity be given to the fact that it will not now be possible to make any further enlargements of civilian candidates for this training until the Army is reduced to a strength of 17,000, and it is estimated that this reduced strength will probably not be reached before the end of the present calendar year."

French Forge Ahead in Channel Air Service

Handley Page Transport, Ltd., the last British air transport company to maintain a regular mail and passenger air service between London and Paris suspended its services on March 3 owing to a reduction in the French rates.

Prior to this date the fare charged by British and French companies was 16 francs (4000 nominal value) for a one-way trip and 16 francs for a return trip. On Jan. 1 this year the French Government, in order to compete with the *Transatlantique* Aeropostale and the *Grenada Express* Aeropostale, reduced the price of the one-way ticket to 200 francs, or about 5 francs. They were enabled to do this owing to the increase in subsidy granted them by the French government, which evidently resulted from their reducing the fare to 300 francs. The *Transatlantique* Aeropostale, as the last operating British company, which struggled along unassisted by the British government, had to close its business.

The situation of British commercial aviation had been a serious one for quite some time. Last summer an advisory committee, which had been appointed to look into the matter, reported in their report in which state assistance to air transport firms was strongly urged. It was pointed out among others that unless some such help became available before long British commercial aviation would disappear by suffocation. The trials of this wretched business appeared when, in December, 1930, the Air Transport and Travel, Ltd., which had been engaged in a passenger service between London and Paris, suspended its services.

It was only then that the British government departed from its no-federal policy and announced that air transport companies operating on approved routes would be subsidized to the extent of 25 per cent of their gross revenue. But for the purpose of 16,000,000 francs, which the state could well finance gratis only at the end of the calendar year, that is, Dec. 31, 1931. That this arrangement proved unsatisfac-

tory to the Handley Page Transport, Ltd., is shown by its suspending the London-Paris service.

The new regulations for the French air transport subsidies differ considerably from the system as it was originally conceived. Previously subsidies were granted under somewhat simplified regulations, the chief factor being distance flown. The new regulations, however, are more exacting. Thus, while French machines have been flying London and Paris, and on other routes, carrying no passengers or goods, the flight being made solely with a view to raising the Government subsidy and obtaining a certain amount of advertisement.

The new regulations provide that operating companies, in order to date the subsidy, must have in service or in reserve a number of twenty-eight single engined seaplanes or four-engine land-engined airplanes. The subsidy amounts to 8 francs per kilometer flown for single engined airplanes and to 12 francs per kilometer flown for seaplanes. A consecutive grantor of 60 per cent of the cost of new aircraft is furthermore demanded by the government.

The total French appropriation for commercial aviation for the current fiscal year is 21,000,000 francs (approximately \$6,000,000 nominal) and for the coming year a much larger sum probably is contemplated. While a large number of these subsidies are granted to the *Transatlantique* Aeropostale, which has been expanded to subscribe to operating companies and the policy in beginning to show results. In fact, the latest statistics in the air fares between Paris and London bring the cost of air travel to the level of railroads and steamship travel. Considering the amount of time saved by air transport, the cost of the passenger fares is not too great, even though five times to land and five times to sea, the French air transport companies seem justified in hoping for a large increase in the number of serial travelers.

"Who's Who in American Aeronautics"

(Copyright, 1931, all rights reserved by The Aviation Model Co., Inc.)

Beginning with the present issue, *AVIATION AND AIRCRAFT JOURNAL* will print a concise biography of Americans who through their achievements in the fields of research, design, construction or operation of aircraft in peace and in war deserve to stand out from among their fellow workers in aeronautics. It is felt that the aeronautical world becomes increasingly of the accomplishments of these men, for it will assist all in gathering a better understanding of the place American aeronautics holds in the world thanks to the constant efforts of our scientists, engineers and inventors towards greater perfection in air navigation. EDITOR.

Orville Wright

Wright, Orville, aeronautical engineer; born, Dayton, Ohio, Aug. 19, 1878; son of Mr. and Mrs. Milton Wright; educated at Weymouth Public Schools, Dayton, Ohio; Bachelor of Science degree; Doctor of Technical Sciences, 1929, Royal Technical College, Munich; Master of Science, 1929, Hochschule für Technik und Bauwesen, Berlin; Bachelor of Science, 1930, Ohio State University; Doctor of Engineering, 1930, University of California; M. A., 1910, Yale University; Medal of Honor, Gold Medal of the Aero Club of France, 1928; Gold Medal of the Aero Club of the United Kingdom, 1928; Grand Diploma of the Royal Institute of Engineers, 1929; Gold Medal of the Academy of Sports of France, 1929; Ohio Medal of Honor, given by the Aero Club of America; Gold Medal of Great Britain, 1929; Gold Medals from the State of Ohio, 1929, from Congress of the United States, 1929, from City of Dayton, 1929; Duesenavia Club of America, 1929; Langley Medal awarded by the Smithsonian Institution, 1910; Caudron Trophy, 1929; "Aero Club House" awarded by the French Republic, 1929; Gold Medals awarded by the Institute of France, Académie de Sciences, 1929; Bronze Medal of the International France Society; Boulle Trophy awarded by the Aero Club of America, 1930; The Wright brothers have been flying between London and Paris, and on other routes, carrying no passengers or goods, the flight being made solely with a view to raising the Government subsidy and obtaining a certain amount of advertisement.

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Walter Glenn Kildare

Kildare, Walter Glenn, Major, Air Service, U. S. Army; born, Shafter, N. Y., July 1, 1896; son of Charles W. Kildare and Mary Elizabeth (Kildare) Kildare; married Ursula Corral, June 4, 1929.

Educated: Syracuse public and high schools; U. S. Military Academy, West Point, New York.

Profession: U. S. Army Officer.

Aeronautical Activities: On continuous flying duty since Nov. 1924; served with 1st Aero Squadron in Mexico with Major Frank P. Murphy; Commanding Officer, Myrtle, Fla., 1925; Commanding Officer, Myrtle, Fla., 1926; Ordered to A. E. F., Gallipoli, 1927; Commanded and operated 3d A. L. C. Isola, France; Chief of all Air Service Training, A. E. F., 1928.

Flight Ratings: J. M. A., 1915; M. A., 1916; Pilot, 1920.

For Service: Army, Commanding officer, Myrtle, Fla., 1925; Commanding officer, Myrtle, Fla., 1926; served in Air Service as an commissioned grades to include Colonel.

For Honor: Awarded Distinguished Service Medal by United States; Order of the Legion of Honor (France).

Ranks: "Customized Manual"; Member, Army and Navy Club (Waco); Aero Club of America.

Military: Army Air Service, Washington, D. C.; later Army and Navy Club, Washington, D. C.

Lorenzo H. Drennan

Drennan, Lorenzo H., Major, U. S. Army; born Taylorsville, Ill., Jan. 4, 1887; son of Lorenzo H. Drennan and Margaret (Sister) Drennan; married Mary Fitchett, June 1, 1914.

Educated: Civilian Manual Training School, U. S. Military Academy, West Point.

Aeronautical Activities: Commanded Ground Officers Training School, Kelly Field; Captain of Officers, Kelly Field, Tex., 1914; Executive Officer, Kelly Field, Tex., 1915; Executive Officer, Kelly Field, Tex., 1916; Executive Officer, Kelly Field, Tex., 1917; Executive Officer, Kelly Field, Tex., 1918; Executive Officer, Kelly Field, Tex., 1919; Executive Officer, Kelly Field, Tex., 1920; Executive Officer, Kelly Field, Tex., 1921; Executive Officer, Kelly Field, Tex., 1922; Executive Officer, Kelly Field, Tex., 1923; Executive Officer, Kelly Field, Tex., 1924; Executive Officer, Kelly Field, Tex., 1925; Executive Officer, Kelly Field, Tex., 1926; Executive Officer, Kelly Field, Tex., 1927; Executive Officer, Kelly Field, Tex., 1928; Executive Officer, Kelly Field, Tex., 1929; Executive Officer, Kelly Field, Tex., 1930; Executive Officer, Kelly Field, Tex., 1931.

Flight Ratings: Airplane Pilot, 1912; J. M. A., 1913; Member Club of America, Aero Club of America, Various service clubs.

Address: 15 North Broadway, Dayton, Ohio; House, Horace and Park Ave., Dayton, Ohio; House, 31 Homer Street, Newton Center, Mass.

ground engineer as only completed when his work has been finished. This is one reason why it must be supervised, but the greatest need for supervision is that the knowledge that he exists, and is effective, prevents that power behind him necessary to make him to suffice his decisions. The best basis for the protection of the public is to require of a ground engineer for a license renewal or the risk of disqualification and replacement by a less conscientious man. If ever, therefore, an operator requires that his ground engineer should grant a certificate of his instructions, the latter should be able to reply that he cannot do so, since the supervisor of the aircraft is responsible for the issuance of his license, and any certificate would then become invalid. On the other hand, the simplest way for a ground engineer to carry his responsibilities is to issue upon immediate implementation of such and every part as soon as the first sign of wear becomes apparent. Commercial considerations, however, would lead to payment. But money and an opposing force is required, obtained by supervision by a disinterested party.

Supervision of the Ground Engineer

In order, therefore, to supersede the work of the ground engineer the power of nonrecognition provided in paragraph 16 of the "Directions" is to be replaced by the power provided in paragraph 17 of the "Regulations" of the Bureau of Navigation of the "Aeronautics Act." It was found at an early date that it was impossible to keep in touch with each individual holder of a ground engineer's license, since a large proportion of those who successfully obtained such licenses did not operate.

It was therefore decided to arrange for periodic re-inspection of all aircraft in use, and thereby supersede the work of the sole ground engineer. The method adopted is as follows:

All certified aircraft used by licensed airmen, the Air Ministry have a complete list of such aeroplanes, which is kept up to date. Each is visited in turn, and the aircraft examined, the work done by the ground engineer supervising the inspection. For each aircraft a record is kept and noted. The reports thus obtained on each ground engineer are also filed and recorded. It has been found that this method gives a useful record of nearly every ground engineer who is operating. Should any engine or its parts be removed from the aircraft, and a new engine substituted, the records are available to ascertain whether the work done are required, special arrangements being made to judge therefore as to the man's capabilities. If the evidence of his qualification thus obtained is unsatisfactory it may be called upon under paragraph 10 of section 4 of the "Aeronautics Act" to submit to re-examination before his license is renewed.

The first two years' experience has shown that operations may be divided into two classes: those whose chief aim is to run a regular and reliable service, who have a number of machines in operation, and employ an organized staff of ground engineers, and the owner-operator or small organization with one or two machines, who have no staff, and depend entirely upon their own ability for "jap-flying," exhibition flights, and the like, at sea coast resorts or inland holiday centers. It is suggested that at this stage the latter class of operator is separated from the point of view of the public's education in flight. A man who has had one or two short flights during his life, and who wants to make a living, is probably one of the most difficult types to manage, and it is a man who has never been on the air. It is, however, that latter class of operator that requires the more careful supervision, and it is stated that the usual number of accidents which have occurred have proved that adequate and efficient supervision is possible without much difficulty to the State, or any body of State officials. In accordance with the "Directions" 20 of course, essential that the supervisory inspector should possess knowledge, ability and experience that will convince the ground engineer concerned that the supervisor wants obtain the confidence of the operator (i.e. the ground engineer's employer).

Duties of a Ground Engineer

A ground engineer is responsible for maintaining the

validity of the certificates of airworthiness, and to do so is required to certify each day on which a flight is made that the aircraft in use is every way fit for flight.

The experience during the past two years has been that in some cases there has been a tendency to consider each certificate as merely a pass of licensure which need be followed by none, and hence have been issued without the ground engineer being present to inspect the aircraft. When the aircraft has been granted an Air Ministry's certificate of airworthiness, the latter has been used in a normal manner, and as reported satisfactory by the pilot, there has been a tendency to assume that it is so, and to certify accordingly without making any actual examination of the machine. This is the result of many cases who hold certificates of airworthiness of their license, and any certificate would then become invalid. On the other hand, the simplest way for a ground engineer to carry his responsibilities is to issue upon immediate implementation of such and every part as soon as the first sign of wear becomes apparent. Commercial considerations, however, would lead to payment. But money and an opposing force is required, obtained by supervision by a disinterested party.

It is suggested that the conditions of the aircraft when setting out for the flight.

(a) The engine of the flight and the proposed load.
 (b) The state and experience of the pilot, particularly with regard to the particular type of aircraft.
 (c) The meteorological conditions at the time of the departure.

Of these factors the second is that which concerns the ground engineer. It may often, therefore, be his duty not only to examine the aircraft, but to make a report which may be held down by his employer, by the reputation for which they may obtain advantages in insurance rates.

It is suggested that it may be found necessary to consider the inspection of a separate grade of ground engineer, in addition to those persons that large operating company would find it difficult to find. The ground engineer should be qualified of one man who had had lower technical qualifications and ability than are required for the ordinary ground engineer. Such a man would go far toward ensuring the reliability of any service and would advance the status of "ground engineering" nearer to that which must be attained if these men are to safeguard adequately the aerial transport of the future.

Design of Wind Tunnel and Wind Tunnel Propellers

N. A. C. A. Report No. 80

This report is a continuation of National Advisory Committee for Aeronautics' Report No. 75. The variations in velocity and direction of the wind stream were studied by means of a research car mounted on a rotating platform. The wind stream was varied both in a 2-foot diameter tunnel and in a 5-ft. full size tunnel, and whenever possible comparison was made between them. It was found that placing radial vanes directly before the propeller in the 2-foot stream increased the efficiency of the tunnel to a considerable extent and the size of the air stream flow. The placing of a horizontal vane across the exit of the tunnel decreased the efficiency of the propeller, but in the case this decreased the efficiency of the tunnel. Several types of diffusers were tried in the return air stream, but only a slight improvement resulted in the smoothness of the flow. Some experiments were tried on the effect of the shape of end walls and it was found that a triangular in all cases gave the best results. The effect of placing a curved vane above the model tunnel of the same propeller in the air stream as the building on the 2-foot tunnel decreased the speed for the same power 14% per cent. Curved spandrels were placed above the propeller in the model tunnel in the hope that they would give increased efficiency and a steeper flow, but in no case was there any improvement.

N. A. C. A. Report No. 80 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

New Instrument Firm

The Consolidated Instrument Co. of America was formed to make manufacturers, importers and dealers a complete engineering and sales service in connection with all types of speed indicating and recording instruments and devices. Its staff is made up of engineers who are pleased in this line, who have by years of research, experimental and manufacturing experience, the knowledge and ability to design, manufacture and invent, and who are therefore equipped to provide expert advice and a unique service wherever it is desired.

Dissidence of Aircraft

The maintenance of aircraft is already of such importance as to call for a separate paper, and on this occasion it is only proposed to touch on one aspect, that of the policies of the ground engineer to the owning company. So far as the Air Navigation Regulations are concerned, the ground engineer is only required to certify that the aircraft is in every way fit for flight, and that (assuming any aircraft is given a license valid for the following points, all of which have to be taken into consideration)—

(a) The design and primary standard of construction of the aircraft.

The Consolidated Instrument Co. of America controls exclusively the entire American distribution of the well known Dutton Tachometers, and has at its disposal the smallest production and experimental facilities offered by its manufacturer, as well as the complete re-operation of its inventor, George W. Dutton.

This company also distributes exclusively throughout the United States, the famous Master Speed Indicator and Tel Speed Recording Device, which have an enviable reputation as practically every part of the civilianized world.

Canadian Air Progress-1920

With the appointment of Lt. Col. E. W. Stedman, as Director of Technical Services, definite steps are now being taken to organize a strong technical branch to undertake the engineering and scientific work of the Air Board, the need for which has been felt for sometime. It is recognized that with the highest efficiency in this branch, the flying services cannot hope to attain their full value, and the control of aerial services, with reference to air traffic, to commercial aviation, to the industry or to the public generally.

The technical branch will not only be responsible for the operation and maintenance of the main engine repair, metal, aircraft repair sections, and other repair depots, but will advise the Controller of Civil Aviation in all technical matters connected with the substitution of streamliners of machines, and will likewise advise the Inspector General of the Canadian Aeroplane Force, and the Director of Flying Operations with regard

to the organization of long-distance flights in Canada, to ascertain as definitely as possible the exact nature of the difficulties to be encountered, with their probable remedies, and to secure detailed information as to the suitability of the various sections of the routes selected for transcontinental flights. In this respect the Air Board feels satisfied that the undertaking has given a measure, and may well pass the way for regular transcontinental flights, and that the present great organization, based on sufficient emergency landing grounds, reliable stations, and sufficient communication to make this has been established.

Flying Operations Branch

Review of Activities During 1920

The director of Flying Operations reports the completion of a successful and encouraging season's operations, notwithstanding the fact that flying did not begin until late in Au-



MAP SHOWING TRANSCONTINENTAL ROUTES FLOWN BY THE CANADIAN AIR FORCE

to technical considerations in connection with improvements in design and modification of machines and equipment.

Medical Services under the Air Board

It has been decided at the instance of commanding and senior officer, to effect standardization of the medical services under the Air Board, and accordingly to appoint the senior medical officer, Captain Dr. H. C. Gough, to officiate as controller of the Civil Aviation branch of the Air Board, who will be designated by a "Director of Medical Services," who will conduct and carry on the duties hitherto performed separately by the two officers above mentioned.

Dr. William H. Conroy, formerly the medical officer employed in the Civil Aviation Branch, becomes Director of Medical Services, and is responsible to the Air Board for the administration of the medical services of the Canadian Air Force, as well as for the medical examination of personnel pilots, he will advise the Air Board of all matters pertaining to hygiene, sanitation and medical research.

Trans-Canada Flights

The trans-Canada flight from Halifax to Vancouver was successfully undertaken and completed. Although undue delays occurred which prolonged the progress of the flight considerably, it is noted that there is a desire among the members of the Canadian Air Board to repeat the flight, and to do so in a more expeditious manner. For the various delays have shown that the difficulties encountered, were more arduous rather than a lack of sufficient ground organization, than from any inherent difficulties in flying as such.

The primary objects in undertaking the flight were to gain knowledge and experience in both the possibilities and limits

of the following is a tabulated summary of the extent of flying carried out during the year and the number of accidents and fatalities that have occurred:

Number of flights made	401
Average distance per flight	100 miles
Average altitude	9,640 ft.
Number of passengers carried	1,000
Number of persons injured	25
Number of persons killed	1

During the winter months the air stations at Roberval, Que., Hemmingford, Que., and Ottawa, Ont. are temporarily closed, however, the flying equipment is kept in Camp Borden, Ont., and Halifax, N. S. The station at Morley, Alk is also closed and will be transferred to High River, Alk.

Fleet Operations

The following operations for various districts are under consideration:

Passenger District.—Forestry work, surveys, fishery protection and patrol, meteorological work and communications. Mackenzie River Basin.—Communications and exploratory work.

Northern Manitoba.—Forestry protection and survey and communications.

Eastern Ontario.—Forestry protection and survey and communications.

Departments to be served.—Interior Department, Mines Department, Indian Affairs, B. C. P. T., Entomological Board, Conservator of Game, and Colonization Department.

Civilians (District).—Experimental flying and survey work.

Departments to be served.—General.

Lake St. John.—Forestry protection and survey, and air transportation.

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Departments to be served.—Quebec Government, Agriculture Department, Conservation Commission and R. C. M. P., New Brunswick.—Forestry work.

Departments to be served.—New Brunswick Government, Engineering Branch and Conservation Commission.

Civil Aviation Branch

Confidence and License Law

The Controller of Civil Aviation reports as follows upon the number of applications and license fees applied for and issued as report to an increased, steadily increasing number for the total period January 1 to December 31, 1920.

Type of Certificate or License Issued	Applications Received	Temporary Certificates Issued	Permit Certificates Issued
Pilot's air pilot certificate	100	2	61
Commercial pilot certificate	120	1	10
Air engineer certificate	10	0	0
All categories of certificates	130	3	10
Certificates of Registration of Air Machinery	100	22	21
Aircraft licenses	100	22	20

* denotes temporary, pending issue of permanent certificate when the former certificate is issued.

Survey of Air Routes

The Controller of Civil Aviation reports upon the following surveys of air routes which have been completed up to the end of December 1920, in all some 7,500 mi. of air routes having been surveyed.

- (1) Airports routes surveyed and flown over—Approximately 3,000 mi.
- (2) Survey of Montreal via Trois-Rivières, via Edmundston, via Fredericton, via Fredericton and Moncton, via Fredericton, via Edmundston and Miramichi, via Edmundston, via Edmundston and Miramichi, via Edmundston to Gaspé.
- (3) Ottawa to Camp Borden, Ont. via Kingston.
- (4) Edmundston to Dawson, Yukon via Jasper, Prince George, Hazelton, Wrangell and Whitehorse. This was surveyed in conjunction with the U. S. Army Air Service, principally to New York to Nome flight.
- (5) Some routes surveyed and flown over—Approximately 2,000 mi.
- (6) Halifax to Winnipeg via St. John, Fredericton, Rivers du Loup, Quebec, Montreal, Ottawa, Sudbey Lake, Sioux, Port Arthur and Kenora.
- (7) Rivers du Loup to Lake St. John, Quebec via the Saguenay River.
- (8) Ottawa to Lake Timiskaming, Ont via Ottawa River.
- (9) Ottawa to Lake St. Mary via Moosehead Lakes and Ottawa River.
- (10) Preliminary surveys of air routes—Approximately 2,500 mi.
- (11) Passover to Lethbridge, Alta. via Brandon, Gimliwood and Teman.
- (12) Passover to Dauphin, Ont via Sioux-Lucknow and Elizabethtown.

Prohibition of Dangerous Flying

It has become evident to the Air Board after a survey of the 1920 season, that sound measures have been taken on the part of civil aviation, due to the action being taken with passengers, pilots, etc., in the case of their own personal safety. As far as possible in starting an air flying, and since no prohibition would be beneficial not only for the purpose of preventing accidents, but also for the purpose of inducing a realization that flying does not involve or impinge the taking of risks, the Air Board has made the following amendment to Air Regulation, 1920, Part 2:

(1) No pilot of any flying machine shall unless he is alone, disease, or has the written permission of his passenger, permit or cause such flying machine to spin, roll, loop or execute any other evolutions involving unnecessary risk.

(2) It shall be a defense to any prosecution under section 4, subsection 2 of the Air Board Act for a breach of the foregoing regulation if the pilot establishes that the dangerous evolution was performed with the intention on his part and notwithstanding the opinion by him of reasonable care.

Application of Air Regulations

In response to a request from the United States Department of State, the Air Board has extended for a further period of six months, (from Nov. 1, 1920, to May 1, 1921) the time during which certain classes of United States pilots and aircraft may be presented to and used by the Canadian inventory, pending the conclusion of a treaty of commerce between the two countries, and no new aircraft may be registered in the United States having an adherence with the International Air Convention. The permission is granted, however, subject to the same provisions as were previously in effect, namely:

(a) Only qualified American military or naval pilots will be excepted from the provisions of Paragraph 3 of the Air Regulations, 1920, in so far as they are entitled to an exemption from the same in the same position with regard to flying in Canada as far as they were the holders of certificates from the government of the United States, in accordance with the International Air Convention, that is, in the position of being entitled to fly United States aircraft in Canada, but not to carry passengers or goods for hire.

(b) Only American aircraft which would, under the Convention relating to International Air Navigation, be responsible in the United States of America, will be exempted from the provisions of Paragraph 3, of the Air Regulations, 1920, provided that:

(1) The aircraft are registered in accordance with the regulations with a nationality and registration marks of which the first letter is the letter "S" and the second letter is the letter "C".

(2) If such aircraft is one which under the regulations would require a certificate of airworthiness, a temporary certificate of airworthiness is issued.

(3) To all whom the same fees are paid as in the case of Canadian aircraft.

The granting of "graving open" exemptions from certain provisions of the Air Regulations 1920 in favor of E. Habicht, a United States citizen, who has been given a contract by the United States Government for the carriage of mail by air between Seattle, Wash., and Victoria, B. C., has been under consideration by the Air Board.

It is the opinion of the Canadian military and naval pilot, and in this case art entitled to the exemption granted to American pilots of that class. Under the circumstances, however, and provided that no exemption Mr. Habicht is found to be a competent pilot and his mechanics worthy, the Air Board has decided to grant him special permission to enter Canada under the regulations, as if he were a qualified military or naval pilot of United States nationality.

Exemptions for Commercial Aviation Certificates

It is of interest to announce that arrangements have been made whereby officers and clerks of the Canadian Air Force taking their regular course of training at Camp Borden, Ont., may, if they so desire, take at the same time the qualifying examinations and tests required for commercial aviation certificates, as commercial pilot certificates, and air engineer certificates.

It is felt that such exemptions will prove of great advantage to many individuals who may be desirous of engaging in commercial aviation, but who, without the facilities now provided for at Camp Borden, would find it difficult to pass the necessary examinations and tests, as laid down under the regulations.

Construction Work at Baddeck, Air Station

It has been decided to maintain this station as a permanent center of maintenance and repair. Plans have been drawn and have been placed in hand to complete this station with two permanent hangars and a small workshop, together with adequate quarters for the staff. It is hoped that this construction work may be completed and ready for use during the flying season of 1921.

Central Air Board Depot

The provision of a much needed central Air Board depot, has recently been under careful consideration. This depot would comprise the main engineering workshops, including the

aircraft repair depot and the engine repair depot, the revised stores depot, and experimental flying station. The present depot at Camp Borden is unsatisfactory owing to its poor communications and distance from a large centre of population.

It has been decided to evaluate the cost of these operations and to determine the most economical plan. The Air Board has nevertheless arranged to locate a stores depot at a point which would be most suitable for the establishment of such a depot at the earliest opportunity.

New Types of Machines for Civil Government Operations

The necessity for the purchase of more modern types of machines, or particular those designed specifically for commercial air transportation and general government operations, in order to offset the adverse effects of these operations, has received the careful consideration of the Air Board. It has received the careful consideration of the Air Board for instance. The machine is one for civil work are of all-weather types and have already seen much service.

To meet this situation the Air Board issued, under date of August 11, a memorandum with specifications calling for tenders for a number of new types of aircraft required for aerial survey work in Canada, Great Britain and the United States. A number of tenders were received and after careful consideration it has been decided to recommend the purchase of six machines of four different types, all of the latest design, which it is considered will be suitable for Canadian conditions.

Course for Aeronautical Research Work

The following grants, amounting to \$4,000, have been made by the Air Board to the end of the year 1930, for aeronautical research work to be carried out by the University and the Aeronautics Research Committee of the Honourable Advisory Council for Scientific and Industrial Research:

(1) To Shirley Smith of Edmonton, Alberta, \$3,000, for work in connection with his experiments on the improvement of barograph diaphragms.

(2) To Professor Angus, University of Toronto, \$3,000, for the investigation of warplane operations at low temperatures.

(3) To Professor Bobb, University of Alberta, \$3,000, for the investigation of the effects of water-cooled engines at low temperatures. In addition to the original equipment, a propeller and other necessary gear, has been sent to Professor Bobb free of charge.

(4) To Professor McLeigh of McGill University, \$2,000, for work to be carried out on anti-freeze mixtures.

Arrangements have also been made for the carrying out of experimental work requested by the Technical Branch by J. R. Parkin, as the head master at the University of Toronto.

Commercial Training

The problem of providing adequate facilities for giving air port instruction in air navigation for those who are desire to qualify for commercial air navigators certificates, has again been under careful consideration by the Air Board. At the present time there appear to be no facilities for persons to undergo the necessary course of training in air navigation, in order to qualify them to pass the required examinations and tests. It is hoped, however, that arrangements may be made to overcome this difficulty at as early date.

Defense Committees

The joint Military and Naval Committee has recently been re-organized and is now known as the Defense Committee. The Air Board is represented on this committee by the Inspector General of the Canadian Air Force, who is one of the four co-chairmen. The other members of the committee represent respectively the Department of Militia and Defense, Department of Naval War and the Royal Canadian Mounted Police.

In order to avoid wasted effort and the unnecessary expenditure of public money, it has been decided to make provision, where necessary, for the extension of the period of training in the case of officers and men attending Camp Borden

who may require a longer period of training in order to qualify in accordance with the standard maintained.

According to this program: "An officer or airman who, at the end of his first short course of training in any rank, is found to be unsatisfactory in any respect, may be given further training as specified by him, as an officer receives under training for an additional four or eight weeks and who is willing to do so, will be retained on duty for the training accordingly."

Civil Aviation in Canada During 1930

Below is an extract from the statistical summary of civil aviation in Canada during 1930, showing the number of aviation companies, sales, fares, passengers and freight carried, number of accidents and fatalities, together with the percentage of accidents and deaths to the number of flights made, total passenger, mail and cargo carried, etc.

In addition to the above, from a review of these statistics, the comparative figures from previous and available in position in the very large number of flight clubs, sales, fares, mail and passengers carried, etc. The record is one which it is believed will compare favourably with similar aviation statistics in Great Britain and the continent.

EXTRACT FROM STATISTICAL SUMMARY OF CIVIL AVIATION IN CANADA, 1930

Number of firms engaged wholly in manufacturing aircraft	95
Number of firms engaged partially in aircraft manufacture	97
Number of firms engaged wholly or partially in aircraft maintenance	1,007
Number of maintenance firms	1,004
Average duration of each flight in minutes	40.6
Average speed of each flight in miles per hour	51.1
Average distance travelled by each flight in miles	22.6
Total weight carried in tons	1,014
Total freight carried in tons	1,014
Number of accidents resulting in death in sea or river accidents	1
Number of non-fatality accidents resulting in injury to passengers	4
Number of accidents resulting in death of third party (occupant of aircraft or otherwise)	1
Number of accidents in which no one was killed or injured	1
Number of fatalities resulting in death in sea or river accidents	1
Number of non-fatality accidents resulting in injury to passengers	4
Number of accidents resulting in death of third party (occupant of aircraft or otherwise)	1
Number of accidents in which no one was killed or injured	1
Passenger, Aircraft, Kilometers	18
Approximate number of machine miles per airplane	170
Passenger, Automobile, Kilometers	7
Passenger, Motorboat, Kilometers	3
Passenger, Air Mail, Kilometers	433
Passenger, Air Mail, Miles	1
Passenger, Automobile, Miles	1
Passenger, Motorboat, Miles	1
Passenger, Air Mail, Miles	1
Passenger, Air Mail, Kilometers	1
Passenger, Automobile, Kilometers	1
Passenger, Motorboat, Kilometers	1
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Opening Exercises of America's First Airway

The tremendous exercises in connection with the opening of the trans-American airway which is to connect the present Washington, D. C., to Dayton, Ohio, via Minneapolis, West Vernon, and Columbus, Ohio, took place at Boeing Field, Alameda, D. C., on Feb. 12, 1921.

There were approximately one thousand Boy Scouts there. The Boy Scout organization is an arm of the U. S. Army Air Service in the promotion of flying by establishing flying fields located and establishing proper competition markers on them. There was a number of very distinguished people present, prominent among them were Brig. Gen. William Mitchell, Mr. Eliot Thompson, Mr. Isaac Green, Mr. Edward D. Shaw, Mr. A. G. MacEacheran and others.



THE FIRST LOOK IN THE AMERICAN MODEL AIRWAY, DC, 1, THE MODEL FOR WASHINGTON, D. C.
Photo © U. S. Army Air Service

After the large marker "D.C. 1" had been laid and white-washed by the Boy Scouts a talk on what air transportation means to us and the future of the service of the United States over the airways was given by Brig. Gen. William Mitchell. At this exercises the new Army Air Service "Messenger" airplane made its first public appearance being flown in from New York by Lieutenant Sperry of the Leavenworth Sperry Aircraft Co. It made nearly three hours complete power flight without landing. The Man of Steel, Captain Eddie Rickenbacker, the "Wings of Parsifal" was from Baltimore, Md., whom that type of plane is about to be put in production, by Captain Triple S. Joyner carrying with him one of the most leaders of Baden-Powell.

Major Mrs. Williams, wife of the Assistant Secretary of War, took a long flight in the Marmon piloted by Capt. W. C. Oder. Demonstration flights were given by many of the pilots at Boeing Field flying S.E. 5's which were followed by demonstration flights of both the Messenger and the Marmon Parasol. Both exhibited unique ability in quickly getting off the ground and in flying in small areas, something remarkable for primitive planes. These planes undoubtedly exhibit characteristics essential in the first partly unpowered type of airplanes that will come into common use within the next few years. Toward the end of the exercises General Mitchell was presented with a copy of one of the first air route maps ever made by the State Department. On this map represented Mr. Nelsom and Mr. Tamm. This ceremony was unusually successful in spite of rather disagreeable weather conditions and the proper inauguration of this immense work which will be formally dedicated early in March thereby creating the first planned airway in the United States which will serve as a model for the expansion of hundreds of other airways throughout the United States.

Summer Camp for R.O.T.C. Students

Authority has been requested of the Adjutant General by the Chief of Air Service to have all students in the R.O.T.C. units, who are taking the advanced work and have expressed preference for the Air Service in their training, attend the summer camp which will be held at Post Field, Fort Sill, Oklahoma. It is believed that about ten thousand students at the Massachusetts Institute of Technology and approximately a similar number at other institutions where this work is being carried on.

This camp will begin in the early part of the summer of 1921, of advanced, and will include training for observers for the Air Service. The advanced course in the R.O.T.C. units is open to qualified students in the advanced and senior classes and the Air Service course comes within this advanced training. After the men attend this camp, after their junior year, upon graduation they agree to accept and receive a commission as second lieutenant in the Air Service. At the time of their graduation they receive the rank of second lieutenant and are assigned to a flying school for training as airplane pilots. The commanding general of the Air Service is given the command of the second Lieutenant Air Service is given in the Reserve but on active status, but at the end of six months service the student is permitted to select whether his commission will remain on active or inactive and when reposed accordingly.

A New Pioneer

C. P. Mayer of Bridgeville, Pa., has developed a plan of building airplanes which ought to stimulate the operations of the country to build "home-made" aircraft. He has engaged Arthur E. Johnson and Associates to design an airplane for his family use, one which can be built for him to have the maximum degree of comfort and safety. After the design has been approved he will have the airplanes built by American manufacturers in the same way that yachtsmen have their pleasure boats built at ship yards.

Mr. Mayer has been interested in aviation since last October and has been having success in getting funds. One of these, referred to as Field No. 1, has a hangar which holds five airplanes. The second and larger field, which is now being cleared of trees, wires, buildings, etc., will be equipped with repair shops and large hangars. Contracts for the planes are already let and the field is to be ready for use in the spring.

The activities of Mr. Mayer have given him the reputation of a man of wide business experience. He is in the timber and lumber supply retailing business, packing house meat, fruiting service, coal stripping operation and underground mining and operation. He controls the Sons' Hills Publishing Co., which is an extensive publishing concern, and will also publish the Goodwill Mills News. He is president of the manager of the Interstate Quarries and Oil Co., which operates in West Virginia, and as director and disseminating influence of the First National Bank of Bridgeville, Pa. At the present time he has under control a gasoline distributing studio in connection with the aviation field so as to obtain uniform gasoline from his own factory.

A New German Aviation Company

An aviation company recently has been organized at Danzig with a subscribed capital of two million marks under the title of the Internationale Luftschiffahrtsgesellschaft Ding. The company takes over the entire present Zeppelin-Danzig and by the end of the year will have the works on an airplane factory and materials to build mobile flying machines for the new air service. It is said that sufficient aviation material is already available for the construction of at least thirty airplanes. The founders of the new members are, a factory proprietor named Lefebvre, who is connected with the Albatros company, and Dr. Dornier, who is the well known company which has entered into a contract with the Polish Government for the conversion of air mail between Danzig-Warsaw-Cracow and regular services between Danzig-Poznan-Cracow have already been decided upon. Mail between Danzig and Warsaw by the ordinary methods of transport take several days so compared with three hours by the airplane service new instituted.



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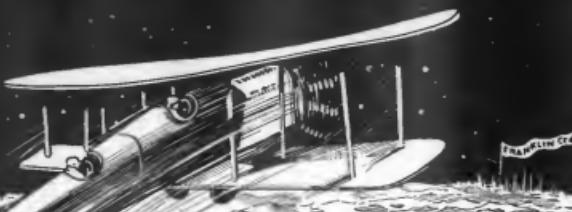
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